

### **Remarks**

Claims 30 and 40-45 are pending. Claim 30 has been amended to correct a typographical error.

Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as anticipated by Reny, WO89/09806 (“Reny”).

Claim 40 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reny.

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,118,434 to Meyer et al. (“Meyer”).

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,455,248 to Wood (“Wood”).

Claims 30 and 40-45 stand rejected on the ground of nonstatutory obviousness-type double patenting over claims 11-19 of U.S. Patent No. 7,655,154.

### **The Rejections Under 35 U.S.C. §§ 102(b) and 103(a) Based Upon Reny**

Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as anticipated by Reny, WO89/09806. To anticipate a claim under Section 102(b), a single prior art reference must disclose each and every element set forth in the claim. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131. As set forth in detail in applicant’s prior submissions, Reny does not disclose any composition that meets all of the limitations of claim 30 as amended. Specifically, Reny does not disclose a non-aqueous heat transfer fluid comprising ethylene glycol and propylene glycol that contains no additives requiring the presence of water to dissolve the additive or to enable the additive to perform its intended function. Because the Examiner has rejected the claims for the same reasons as in prior Office Actions, applicant incorporates the comments previously filed. The following comments address the examiner’s responses to the arguments previously made by applicant.

In response to applicant's argument that Reny does not disclose a non-aqueous heat transfer fluid comprising ethylene glycol and propylene glycol, the Examiner refers to page 3, lines 1-15 of Reny which states that *some unspecified and undefined combination of alkylene glycols* may contain between 0 to 3 parts by weight added water. Reny *does not* state that combinations of ethylene glycol and propylene glycol do not require added water. The Examiner cites to a passage at page 5, lines 25-35 of Reny as further support for the proposition that Reny anticipates claims 30 and 41-45 as amended. This passage adds nothing to the disclosure at page 3 of Reny, as it also refers to *some unspecified and undefined combination of alkylene glycols*.

These passages cited by the Examiner cannot anticipate Reny because they do not describe a heat transfer fluid meeting all of the limitations of claims 30 and 41-45. These passages do not describe any heat transfer fluid containing ethylene glycol and propylene glycol much less describe a heat transfer fluid meeting all of the limitations of claims. Anticipation under 35 U.S.C. § 102(b) requires that the cited reference describe a composition meeting all of the limitations of the claims. The general descriptions in Reny regarding unspecified combinations of ethylene glycol and propylene glycol do not meet this requirement and therefore do not anticipate the claims.

Indeed, Reny's description of heat transfer fluids containing ethylene glycol and propylene glycol teaches that a phosphoric acid buffer and added water are required for this type of heat transfer fluid. This is consistent with the evidence previously provided by applicant in the Declaration of John W. Evans that, at the time of Reny, those skilled in the art thought that ethylene glycol containing heat transfer fluids required a buffer.

The Examiner also points to the compositions at page 9 of Reny that contain ethylene glycol and propylene glycol as anticipating the claimed heat transfer fluids. Neither of the fluids described on page 9 of Reny meet all of the limitations of the fluid resulting from the claimed

method. Fluid 2 contains 1 part added water and phosphoric acid, an additive that requires water in the fluid to function. Accordingly, this fluid does not meet all of the limitations of claims 30 and 41-45. Fluid C<sub>2</sub> does not contain any corrosion inhibitors at all, much less a corrosion inhibitor that is soluble in ethylene glycol and propylene glycol, and C<sub>2</sub> does not anticipate the claims for at least this reason.

In sum, there is no heat transfer fluid described in Reny that meets all of the limitations of claims 30 and 41-45. Accordingly, Reny does not anticipate these claims, and the rejection of claims 30 and 41-45 based upon Reny should be withdrawn.

Reny does not teach or suggest the combination of ethylene glycol and propylene glycol in the amounts recited in claim 40. Moreover, as described above, Reny does not teach any combination of ethylene glycol and propylene glycol without the addition of phosphoric acid and water. To the contrary, Reny's teachings are consistent with what those skilled in the art thought at the time -- that heat transfer fluids containing ethylene glycol required a buffer and added water.

For at least the reasons set forth above, as well as the reasons previously set forth by applicant, Reny does not describe, or otherwise teach or suggest, a heat transfer fluid as defined in the specification and recited in claims 30 and 40-45 comprising ethylene glycol and propylene glycol and that does not contain any additives that require water to dissolve the additives in the fluid or to enable the additives to function in the fluid.

#### **The Rejection Under 35 U.S.C. § 103(a) Based Upon Meyer**

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) in view of Meyer, U.S. Patent No. 5,118,434. This reference, and the reasons that it does not render the claimed methods obvious, have been discussed in detail by applicants in their prior responses to office

actions. In addition to these reasons, applicant addresses in more particularity the statements made by the Examiner in response to applicant's arguments.

The Examiner first states that it is unclear why the reduction in toxicity in the heat transfer fluid was an unexpected result. As applicant has previously explained, and as explained in detail in applicant's prior responses, it had been previously thought that the addition of a less toxic substance to a more toxic substance will result in a mixture that is reduced in toxicity compared to the toxicity of the more toxic substance only as a result of dilution of the more toxic substance. Indeed, this was the reason that the industry had used the formula described in the specification based upon dilution. In the case of non-aqueous heat transfer fluids containing substantial amounts of ethylene glycol, this accepted formula predicted that the reduction in toxicity by dilution was insufficient to render the fluid non-toxic. As described in the application, laboratory testing sponsored by the applicant surprisingly revealed that fluids containing substantial percentages of ethylene glycol when mixed with propylene glycol resulted in fluids that were far less toxic than predicted due to dilution. This result was unexpected, and none of the references cited by the Examiner so much as mention toxicity of the fluids, much less describe or suggest the reduction in toxicity discovered by applicants.

In any event, Meyer does not teach or suggest the methods of claims 30 and 40-45, or the heat transfer fluids resulting from these methods. Meyer is directed to use of polymeric additives to alkylene glycol based fluids to prevent precipitation of salts in the fluids. Col. 1, lines 39-43. The fluids described in Meyer describes deicing solutions comprising alkylene glycols, water, corrosion inhibitors, and one or more polymeric additives. Meyer states at Column 2, lines 58-61 that the composition contains "up to 50 percent water" and preferably between 1 and 10 percent water by weight. All of the fluids in Examples 1-8 contain added water (about 50% water), and claim 1 recites that the fluid contains "up to 50 percent by weight water."

The Examiner focuses on the “up to” language of Meyer to support the position that Meyer describes fluids containing no added water. When properly read in context, however, it is clear that the “up to” reference of Meyer is establishing a maximum water content rather than a minimum. Meyer states that the fluid preferably contains 1 to 10 percent by weight water. Meyer does not describe or suggest any fluid containing no added water. The lowest water content even suggested by Meyer is 1 percent by weight.

Moreover, Meyer describes adding a polymeric material that increases the viscosity of the fluid and prevents precipitation of salts contained in added water. Increasing the viscosity of a glycol containing fluid is undesirable in heat transfer applications. To arrive at the heat transfer fluids produced by the methods of claims 30 and 40-45, the fluid of Meyer would have to be modified by (1) removing the polymeric additive, (2) reducing the water content to zero despite nothing in Meyer that suggests doing so, and (3) using both ethylene glycol and propylene glycol in the proportions claimed despite no teaching of specific proportions of these components in Meyer (all of the examples in Meyer contain only ethylene glycol). The Examiner has not presented any reason that one skilled in the art would make all of these modifications to the fluids described. For at least these additional reasons, the claims as amended are not obvious under 35 U.S.C. § 103(a) in view of Meyer.

#### **The Rejection Under 35 U.S.C. § 103(a) Based Upon Wood**

Claims 30 and 40-45 also stand rejected under 35 U.S.C. § 103(a) in view of Wood, U.S. Patent No. 4,455,248. This reference, and the reasons that it does not render the claimed methods obvious, have been discussed in detail by applicants in their prior responses to office actions. In addition to these reasons, applicant addresses in more particularity the statements made by the Examiner in response to applicant’s arguments.

Wood describes an antifreeze composition for use in automotive cooling systems or other heat transfer services. Wood states that the composition “necessarily” contains sodium metasilicate. Col. 3, lines 27-55. As applicants previously demonstrated by specific evidence, although Wood states that “the antifreeze may be formulated as a concentrate using little or no water”, (col. 3, lines 7-8), the requirement that the fluid described by Wood contain sodium metasilicate necessitates the addition of sufficient water for the sodium metasilicate to dissolve and remain in solution, i.e. in order for the sodium metasilicate to function. Accordingly, for at least this reason, Wood does not teach or suggest a heat transfer fluid composition as recited in claim 30 as amended, which recites that the heat transfer fluid of the present invention contain no additive requiring the presence of water in the fluid to dissolve the additive or to enable the additive to function.

The Examiner focuses on statements in Wood that an anti-freeze concentrate may be formed “containing little or no water.” Wood goes on to state that, even in these concentrates, there it “typically” between 0.1 and 10 parts by weight water, and preferably 1 to 5 parts water. Col. 3, lines 8-13. Indeed, the example of an antifreeze concentrate described in Wood contained 3.2% by weight water. Example 1, col. 5, lines 9-15. One skilled in the art reading Wood would immediately recognize that Wood’s suggestion that a concentrate containing sodium metasilicate can be formed with no added water is wrong, and Wood does not provide any examples of such a fluid.

In addition, the concentrate described by Wood is not intended to function as a heat transfer fluid at all. Wood states that for use in an automotive cooling system, the concentrate must be diluted with substantial amounts of water. Col. 3, lines 16-23. Accordingly, the heat transfer fluids described by Wood contain substantial water.

Finally, although Wood generally states that mixtures of glycols may be used in the anti-freeze compositions described therein, Wood does not teach or suggest combining ethylene glycol and propylene glycol in any specific proportions, much less in the proportions recited in the amended claims. As described in the application, the present inventors discovered that adding relatively small amounts of propylene glycol to ethylene glycol unexpectedly resulted in a non-aqueous heat transfer fluid having substantially reduced toxicity. Wood does not teach or suggest combining ethylene glycol and propylene glycol in any specific amounts, much less in the proportions recited in the amended claims.

Accordingly, for at least these reasons, the methods recited in the amended claims are not described, taught or suggested in Wood, and applicants respectfully submit that the rejection under 35 U.S.C. § 103(a) based upon Wood is traversed based upon the amendments to the claims.

#### **The Double Patenting Rejection**

Claims 30 and 40-45 stand rejected on the grounds of nonstatutory obviousness type double patenting over claims 11-19 of U.S. Patent No. 7,655,154. While applicant does not admit that the claims of the present invention are obvious in view of any one of the claims of U.S. Patent No. 7,655,154, if this is the sole remaining grounds of rejection, applicant will file a terminal disclaimer to obviate the double patenting rejection.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.


Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections.

Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A Petition for Extension of Time extending the deadline for submission of this paper until February 22, 20011 is filed herewith. No additional fee is believed to be required. If any fee is required, or if necessary to cover any deficiency in fees previously paid, authorization is hereby given to charge our Deposit Account No. 50-3569.

Respectfully submitted,

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